

RU 2098720 C1

(54) An arrangement for producing a steam-gas mixture

(57) The field of use: heat power industry; the invention can be suitably used for treatment of construction materials by heat/moisture, for said treatment of the concrete articles in situ; as well as for supply of heat for commercial and household consumers.

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In the claimed arrangement, the steam-gas mixture is obtained by heating the dispersed water particles, as they are caused to hover by a rotating flow of high-temperature flue gases; in the course of said heating, velocity of the flue gas flow exceeds that of hovering of water particles owing to the presence of a confuser. Rotation of the flue gas flow, brought about by curvilinear inclination of the vanes positioned in the gas conduit, extends the path of movement of the flue gas flow in the water particle hovering zone, which circumstance ensures the complete evaporation of water particles and mixing of the flue gases with steam. This type of intensification of production of a steam-gas mixture improves production capacity of the arrangement, and simplifies its design.

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SU 1812416 A1

The invention relates to heat power industry, and can be suitably used for the in-contact heating of water by products of combustion of natural gas; and also can be used in heat-supply engineering.

The invention is directed to an improved efficiency by way of intensification of heat exchange / mass transfer; and it is also directed to prevention of entrainment of droplets.

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The claimed heat-recovery arrangement operates as follows.

In the normal mode of use: the flue gases enter shell 1 of the arrangement, pass through sprinkler 2 provided with spraying nozzles, where said flue gases are mixed with the sprinkled

water, then the gases reach the heat-exchanging surfaces being bundles of pipes 3, which pipes of the first bundle on the gas path have ribs 4 implemented as the longitudinal, fin-shaped and perforated ribs. Said ribs 4, that deflect the flow, are disposed at an angle, the angle being determined in accordance with a pipe pitch in a bundle.

The steam-gas mixture, that reaches ribs 4, is divided into two flows: a portion of the deflected water in the form of drops, particularly finely dispersed, is supplied onto heat-exchanging surfaces 3, such that the droplet moisture is prevented from slipping over in the clearance; the other portion passes through perforations in ribs 4, where droplets disintegrate and form a moisture film on the ribs, which results in additional turbulization of the flow and in intensification thereof.

Then, said flows, having passed ribs 4, combine into single flow and reach heat-exchanging surfaces 3. After that, the steam-gas flow from heat-exchanging surfaces 3 passes the turn 5 area, where it turns by 90°, and proceeds to sections of heat exchanger 8, which heat exchanger is of the contacting type and consists in sections of perforated members, catching a portion of splashes from moisture collector 6; and moves along half-pipe 11, where said flow on the perforated surface of said half-pipe creates a water film - as the result of the change in aerodynamics of movement of the flow itself that passes through the perforated apertures of half-pipe 11. Interaction of the incoming steam-gas flow and the water film on the surface of half-pipe 11 results in heat exchange / mass transfer, with subsequent fall of temperature of the flue gases and with heating of the water film by the latent heat produced by formation of water steam that is present in the steam-gas flow, which flow, by gravity exits from half-pipe 11 and additionally heats up the sprinkled water.

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(54) A method for extinguishing fire of a gas jet or oil gusher, and an arrangement therefor

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The invention relates to fire fighting, and in particular it relates to means for extinguishing fire in oil and gas wellbores, and can be suitably used to improve efficiency of extinguishing fire occurring in gas jets or oil gushers of a great discharge.

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The claimed method is carried out as follows.

Into a gas stream, for example being exhaust gases of a rocket engine, formed in the fuel combustion zone (Fig. 1, 2), a coolant-droplet liquid is introduced for the purpose of the combined transportation by jets into the fire zone, which liquid does not sustain burning, water - for example; after that the stream is caused to accelerate, using Laval nozzle - for example, to the supersonic velocity, M being 3 at least.

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RU 2013112

(54) A method for purifying the exhaust gases from rotary kilns of cement mills

(57) Field of use: purification of, and heat-recovery from the exhaust gases from rotary kilns of cement mills. The essence of the invention: gases are caused to go through an electric filter, through a neutralization reactor where the residual dust and acid oxides are removed by sprinkling of dispersed water; the gasses pass through a separate apparatus, where gases are cooled and steam is condensed by scrubbing with the use of the dispersed water. Then the gases are delivered to the stage of production of CO₂, by liquification. The sludge formed in the reactor is supplied, via a water heater, for preparation of the cement slurry feed for rotary kilns. The hot water from the

scrubber is delivered for heating of buildings and water heating.

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SU 1495415 A1

(54) A steam-gas turbine unit

The claimed unit operates as follows.

The incoming air flow rotates wind wheel 5 that transmits the generated force, via reduction gear 6, to shaft 7 of the steam-gas turbine unit; said air flow passes by swinging body 1 oriented towards the wind direction by means 4 (Fig. 1). A portion of the incoming air flow enters air intake 9, passes through heater 24, where the flow is cooled, transferring its heat to the moisture (Fig. 2). Thereafter the air is compressed in compressor 8, and is supplied, via piping 16, to an air accumulator and combustion chamber 13, to which chamber a fuel through nozzle 14 and steam by line 14 that delivers a dispersing medium are fed simultaneously. The steam-gas mixture formed by combustion of the fuel is delivered to gas turbine 11 that rotates electric generator 10.

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SU 560632

(54) A method for purifying a gas

The invention relates to the systems for conditioning and purifying gases comprising hygroscopic particles; and can be suitably used in chemical, petrochemical industries, and in other industries.

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Gases comprising hygroscopic particles enter apparatus 1 for preliminary treatment, in which apparatus gas is moistened and cooled to a temperature about the dew point, or by 5 - 10°C over that point. After that the so formed steam-gas mixture is kept in vessel 2 at said temperature for 1 - 2 seconds. At the temperature of gases approximating the dew point, a great difference of partial pressures emerges, which difference is the

cause of intense growth of hygroscopic particles, as steam condenses on the particles.

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A fast growth of hygroscopic particles improves efficiency of their deposition in prior-art designs, the energy consumption being the same.

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SU 27009

Description of an arrangement for extinguishing fire in oil wellbores by pumping the liquids and gases, that do not sustain burning, into a wellbore